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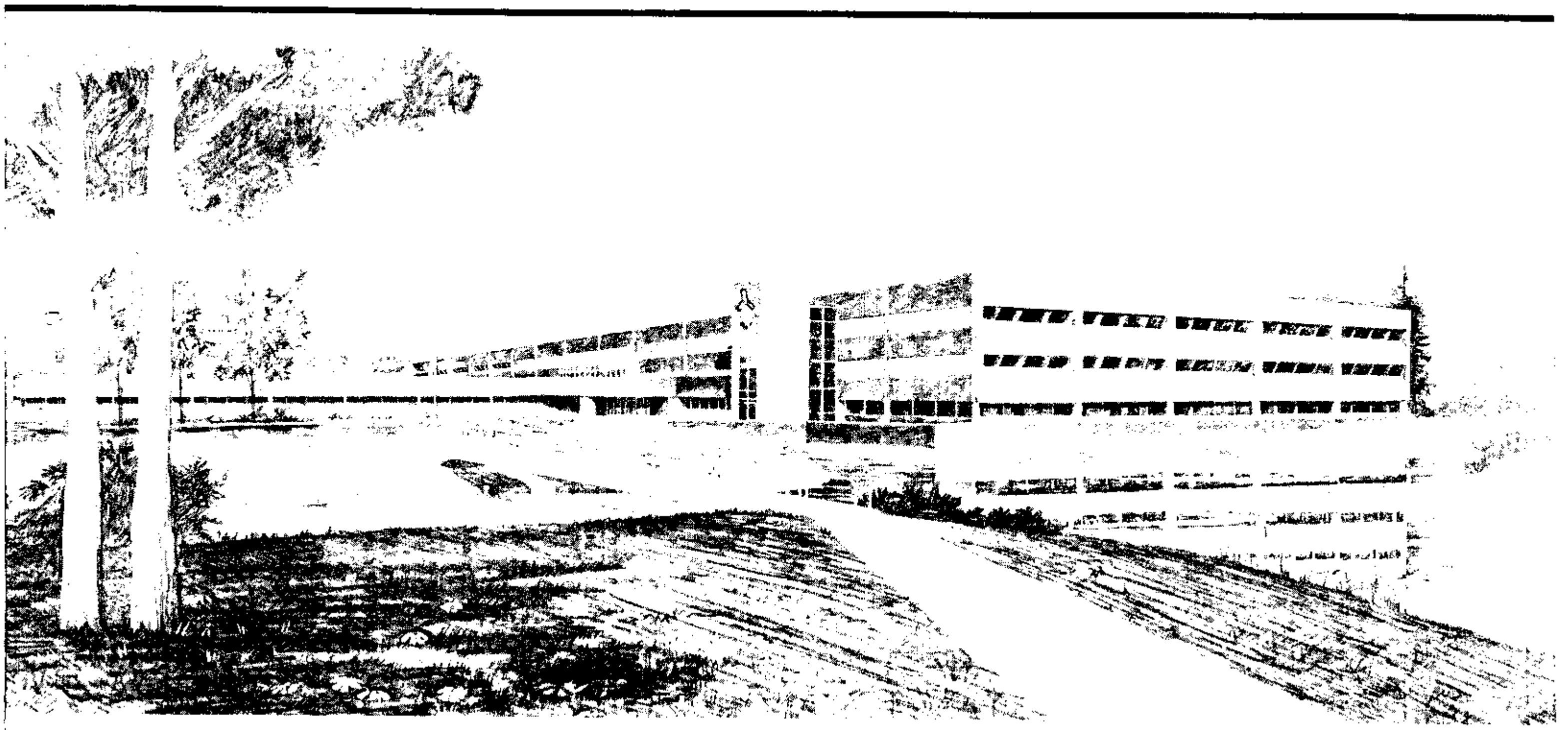

Idaho National Engineering Laboratory
Operated by the U.S. Department of Energy

Final Report

Decontamination and Decommissioning of the BORAX-V Leach Pond

Donald L. Smith

January 1985

Prepared for the
U.S. Department of Energy
Under DOE Contract No. DE-AC07-76IDO1570

EG&G Idaho

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FINAL REPORT

DECONTAMINATION AND DECOMMISSIONING OF THE BORAX-V LEACH POND

Reviewed by:

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FINAL REPORT

DECONTAMINATION AND DECOMMISSIONING OF THE BORAX-V LEACH POND

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EG&G Idaho, Inc.
Idaho Falls, Idaho 83415

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ABSTRACT

This report describes the decontamination and decommissioning (D&D) of the BORAX-V leach pond located at the Idaho National Engineering Laboratory (INEL). The leach pond became radioactively contaminated from the periodic discharge of low-level liquid waste during operation of the Boiling Water Reactor Experiments (BORAX) from 1954 to 1964. This report describes work performed to accomplish the D&D objectives of stabilizing the leach pond and preventing the spread of contamination. D&D of the BORAX-V leach pond consisted of backfilling the pond with "clean" soil, grading and seeding the area, and erecting a permanent marker to identify very low-level subsurface contamination.

SUMMARY

The BORAX-V leach pond was used from 1954 to 1964 to collect low-level radioactively contaminated liquid discharged from the BORAX-II, III, IV, and V experiments. These experiments were conducted at the reactor facility now referred to as the BORAX-V Reactor Facility.

Objectives of this D&D Project were to stabilize the pond area and prevent the spread of contamination. This was accomplished by backfilling the pond basin with radiologically clean soil, and grading and seeding the backfilled area. A permanent marker was installed on the backfilled area to identify subsurface contamination.

The principal man-made subsurface radioisotopes at the BORAX-V leach pond are Cs-137, Co-60, and Sr-90. The maximum radioisotopic concentrations measured were 175, 25, and 0.19 pCi/g of Cs-137, Co-60, and Sr-90, respectively.

D&D operations of the BORAX-V leach pond began in July, 1984 and were completed by the end of August, 1984. The total project cost, including labor and material, was $20K. No radioactive waste was generated and no measurable radiation exposure to workers occurred.

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FINAL REPORT

DECONTAMINATION AND DECOMMISSIONING OF THE BORAX-V LEACH POND

1. INTRODUCTION

BORAX-V Leach Pond History

The BORAX-V leach pond was used from 1954 to 1964 to collect low-level radioactively contaminated liquid discharged from the BORAX-II, III, IV, and V experiments. These experiments were conducted at the facility now referred to as the BORAX-V Reactor Facility. The BORAX series of reactors began with BORAX-I in 1953. This reactor was located about 100 meters southwest of the existing BORAX-V reactor building and did not discharge liquid to any leach pond. BORAX-I was used to demonstrate the feasibility of boiling water reactors (BWR), and was deliberately destroyed in 1954 during reactivity insertion experiments. A new site, approximately 100 meters northeast of BORAX-I, was chosen for subsequent experiments. BORAX-II was constructed in late 1954 for further tests using new core combinations with varying uranium enrichments. BORAX-III, operated in 1955, was designed to investigate the use of BWRs for generating electric power. On July 17, 1955, it produced sufficient power experimentally to power and light the city of Arco, Idaho—an American first. BORAX-IV, operated from 1956-1958, was used to test high thermal capacity fuel elements made from mixed oxides of uranium and thorium. Following BORAX-IV experiments, the reactor facility received major modifications to accommodate a new reactor vessel. These modifications were completed in 1962 and BORAX-V operated from 1962 to 1964. BORAX-V was used for determining the safety aspects and feasibility of an integral nuclear superheat system.

During the years, liquid waste was periodically discharged to the leach pond (1954 to 1964), no record was kept of the contaminants released to the leach pond, and no historical data were found to indicate the kind and extent of contamination that might exist in the pond.

Decommissioning Project Background

The U.S. Department of Energy (DOE), Idaho Operations Office, has assigned EG&G Idaho, Inc., the responsibility for implementing the Decontamination and Decommissioning (D&D) program at the Idaho National Engineering Laboratory (INEL).

The radiological characterization, decision analysis, and D&D of the BORAX-V leach pond were performed separately from the BORAX-V Reactor Facility. The leach pond was characterized in 1982 and documented.[1]

A decision analysis[2] was performed in 1983 to select the appropriate D&D method for the BORAX-V leach pond. Several alternatives were considered, and the decision was made to leave soil contaminants and pipes in place, backfill the leach pond with radiologically clean soil, and permanently mark the area with a monument.

A D&D plan based on the decision analysis was written and published in May, 1984.[3] DOE authorized the necessary funds, and the project was completed in August 1984.

2. BORAX-V LEACH POND DESCRIPTION PRIOR TO DECOMMISSIONING

Location and Physical Description

The BORAX-V leach pond was located near the BORAX-V Facility which is in the southwestern part of the INEL as shown in Figure 1. The BORAX-V leach pond was located approximately 60 ft south of the BORAX-V cooling tower as shown in Figure 2. The pond basin was approximately 20 x 90 ft and was about 1 ft below grade

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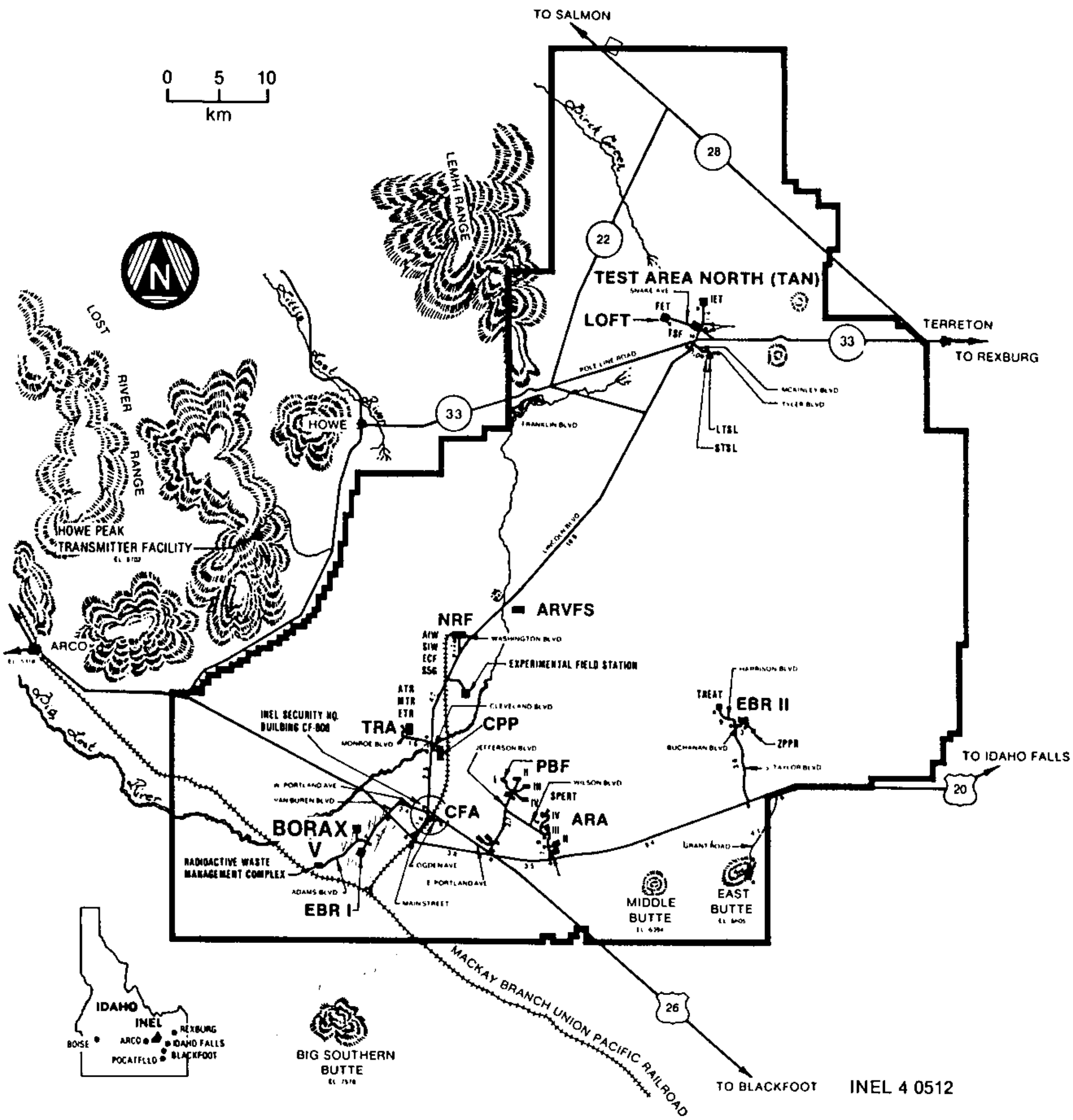


Figure 1. Map of INEL showing the location of BORAX-V.

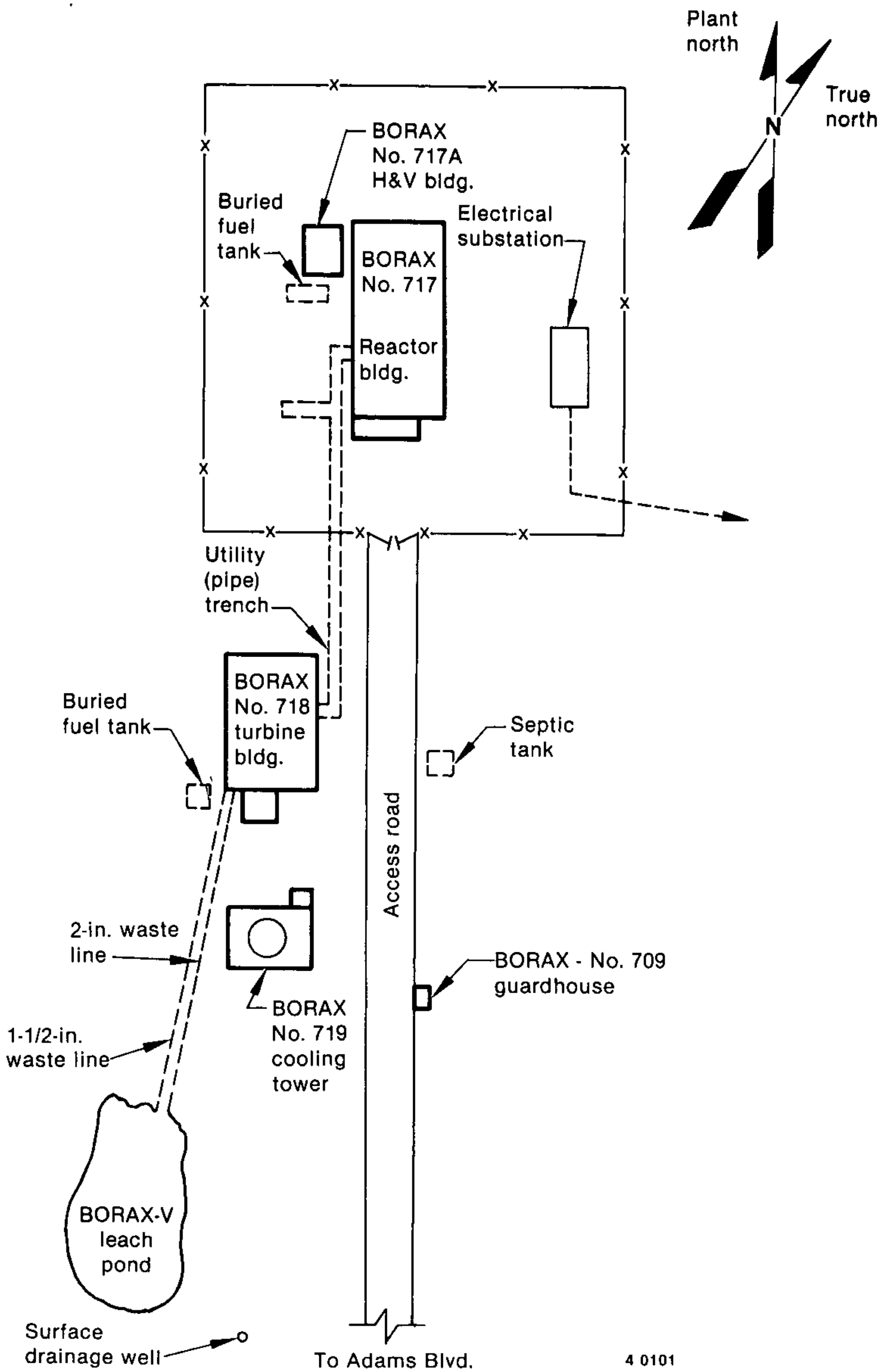


Figure 2. BORAX-V area showing relative location of leach pond.

on the west side and 3 ft below grade on the other three sides. A photograph of the pond taken before D&D is shown in Figure 3. Two underground carbon steel waste lines outlet to the pond as shown in Figure 4. The riser and funnel on the 2 in. pipe were recently used to pour water into the pipe to verify the origin of that pipe. The facility process piping drawing shows only a 2 in. waste line to the leach pond. Probably during the modifications to the BORAX facility in 1960-1962, the 2 in. waste line was newly installed and the existing 1-1/2 in. line was capped and abandoned in place. Figure 5 outlines the path of the wastewater line from the reactor building to the leach pond. In Figure 5, the 1-1/2 in. line is shown coming only from the turbine building; the route of this pipe is not known exactly.

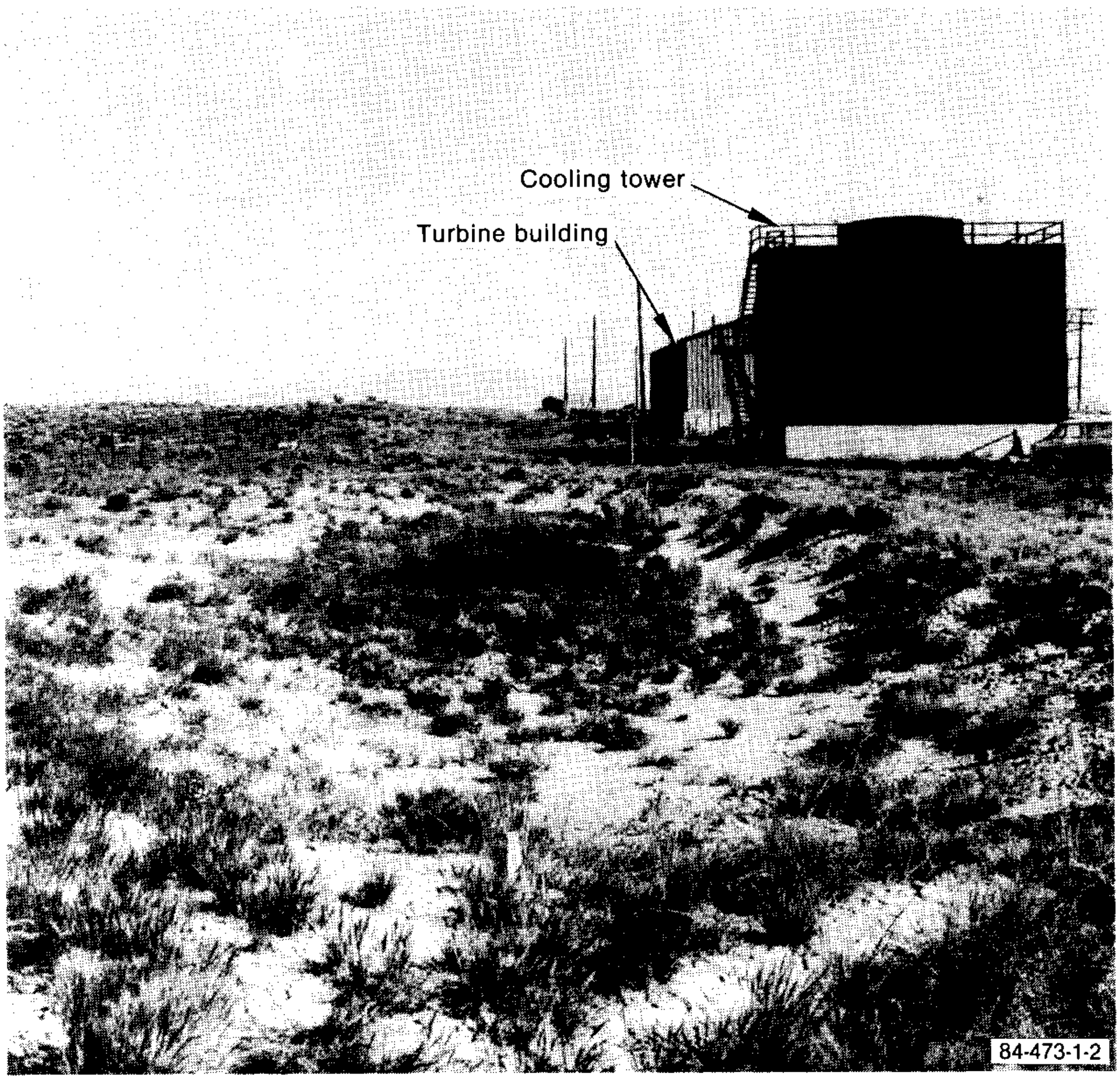


Figure 3. BORAX-V leach pond prior to D&D.

Figure 4. Waste water outlets to leach pond prior to D&D.

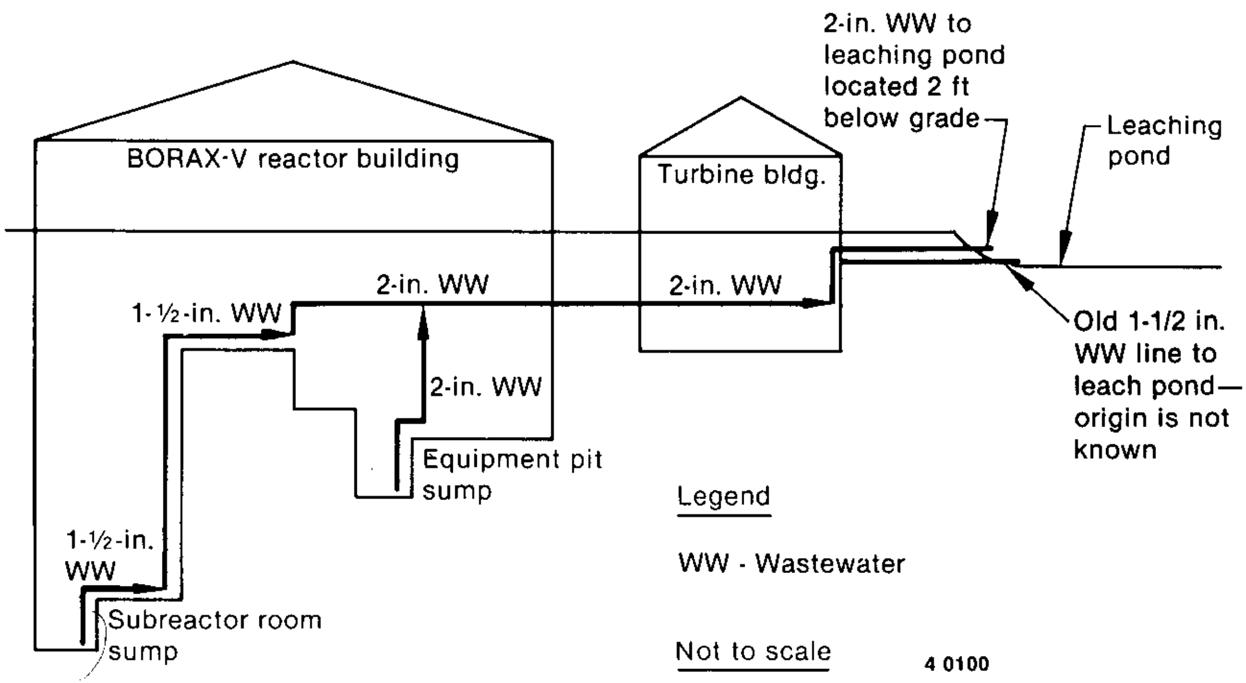


Figure 5. BORAX-V wastewater pipelines.

Radiological Description

The characterization of the BORAX-V leach pond consisted of a radiological survey, in situ trench readings, surface and trench soil samples, smears and a concrete sample from the hatch cover located at the northwest section of the grid, and smears and rust samples from the pipe outlets at the pond. Prior to characterization, the leach pond area was gridded into an area 180 x 200 ft with 10 ft grid intervals. The gridded area showing the pond basin and relative elevations surrounding the pond basin is shown in Figure 6. Pre-D&D radiation fields at the soil surface are given in Figure 7. Locations where soil surface and subsurface samples were collected are designated in Figure 8. The concentration of gamma emitting radioisotopes in the soil surface samples is given in Table 1. The concentration of gamma emitting radioisotopes in the subsurface samples is given in Table 2. One surface sample and four subsurface samples were also analyzed for alpha and beta emitting radioisotopes. The results of this analysis are shown in Table 3. The radiation fields at various depths inside the trenches are given in Table 4.

The characterization indicated that the contaminated soil is mostly contained in a layer of soil from 18 to 36 in. below the surface. Apparently a layer of clean soil was deposited over the pond surface after shutdown of BORAX-V. Because of this layer of clean soil, it was not possible to determine the outer boundary of contamination without taking many core samples. It is assumed, however, because of the high earth banks surrounding the pond basin which contained the discharged liquid, that the contamination was contained within the pond basin perimeter.

No contamination was detected in the 2 in. or 1-1/2 in. pipe by gamma spectroscopy of smears or rust and scale taken from inside each pipe.

Smears taken from the concrete hatch cover located in the northwest corner of the gridded area produced no detectable gamma radioactivity above background by gamma spectroscopy. Nondetectable radioactivity in smears is radioactivity that is less than 10 pCi of Co-60, Cs-134, and Cs-137 per smear. Nonsmearable radioactive contamination was detected through gamma spectroscopy of a concrete sample taken from the hatch cover. The radioactivity in this sample consisted of 5.3 pCi/g of Co-60 and 129 pCi/g of Cs-137.

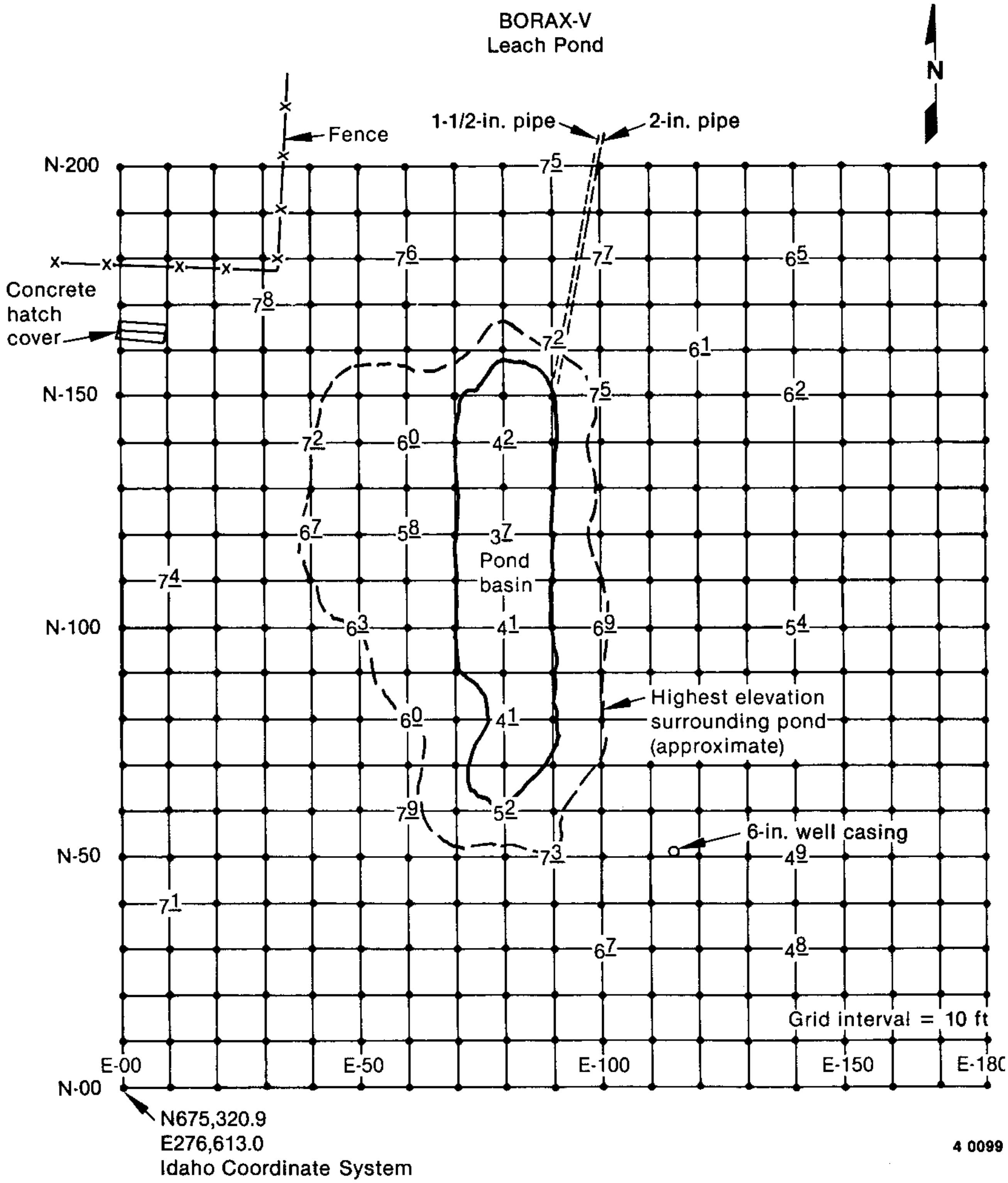
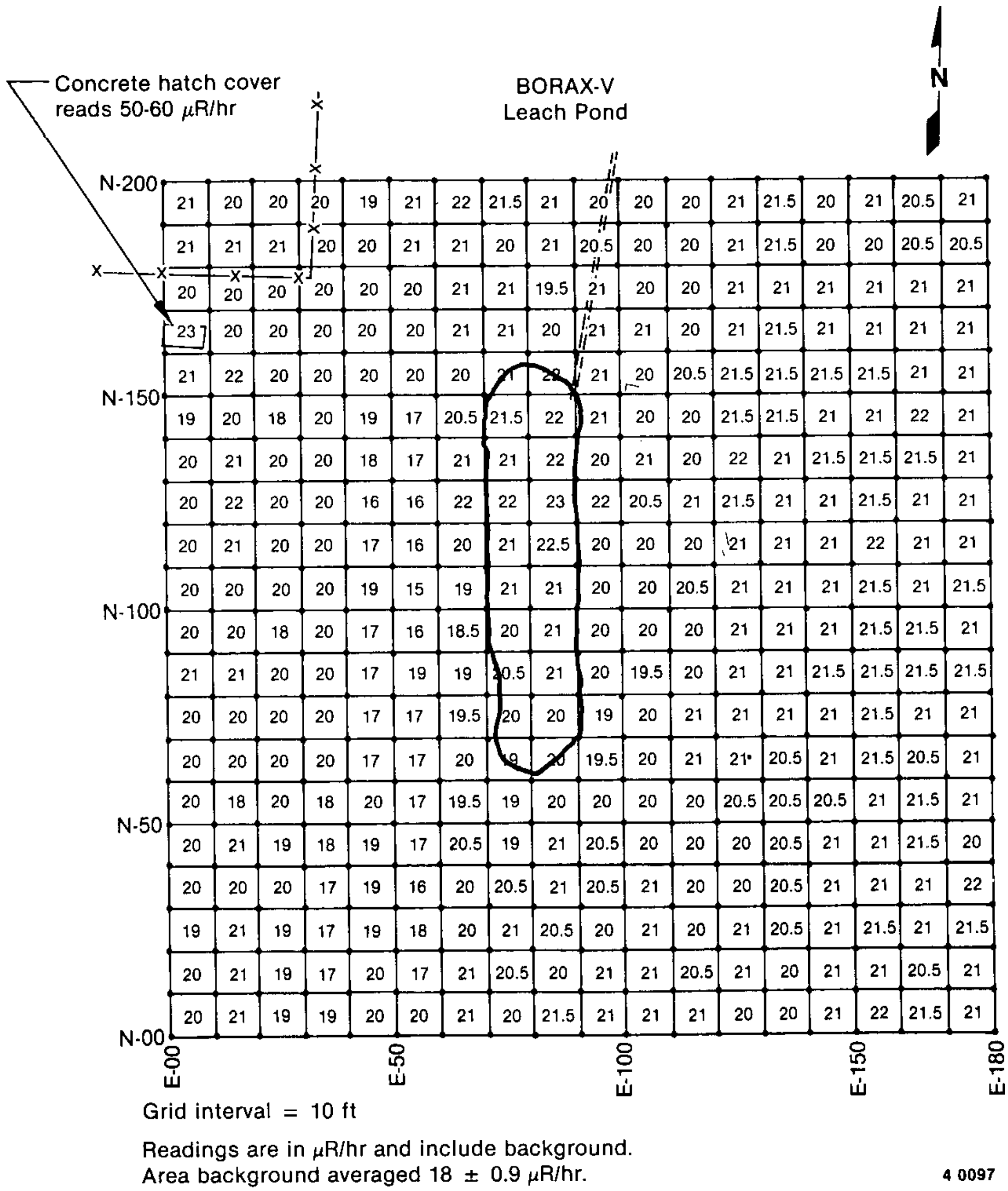


Figure 6. BORAX-V pond area showing relative elevations in feet and tenths of a foot.



21	20	20	20	19	21	22	21.5	21	20	20	20	21	21.5	20	21	20.5	21
21	21	21	20	20	21	21	20	21	20.5	20	20	21	21.5	20	20	20.5	20.5
20	20	20	20	20	20	21	21	19.5	21	20	20	21	21	21	21	21	21
23	20	20	20	20	20	21	21	20	21	21	20	21	21.5	21	21	21	21
21	22	20	20	20	20	20	21	22	21	20	20.5	21.5	21.5	21.5	21.5	21	21
19	20	18	20	19	17	20.5	21.5	22	21	20	20	21.5	21.5	21	21	22	21
20	21	20	20	18	17	21	21	22	20	21	20	22	21	21.5	21.5	21.5	21
20	22	20	20	16	16	22	22	23	22	20.5	21	21.5	21	21	21.5	21	21
20	21	20	20	17	16	20	21	22.5	20	20	20	21	21	21	22	21	21
20	20	20	20	19	15	19	21	21	20	20	20.5	21	21	21	21.5	21	21.5
20	20	18	20	17	16	18.5	20	21	20	20	20	21	21	21	21.5	21.5	21
21	21	20	20	17	19	19	20.5	21	20	19.5	20	21	21	21.5	21.5	21.5	21.5
20	20	20	20	17	17	19.5	20	20	19	20	21	21	21	21	21.5	21	21
20	20	20	20	17	17	20	19	20	19.5	20	21	21	20.5	21	21.5	20.5	21
20	18	20	18	20	17	19.5	19	20	20	20	20	20.5	20.5	20.5	21	21.5	21
20	21	19	18	19	17	20.5	19	21	20.5	20	20	20	20.5	21	21	21.5	20
20	20	20	17	19	16	20	20.5	21	20.5	21	20	20	20.5	21	21	21	22
19	21	19	17	19	18	20	21	20.5	20	21	20	21	20.5	21	21.5	21	21.5
20	21	19	17	20	17	21	20.5	20	21	21	20.5	21	20	21	21	20.5	21
20	21	19	19	20	20	21	20	21.5	21	21	21	20	20	21	22	21.5	21

Figure 7. Radiation fields at soil surface prior to D&D.

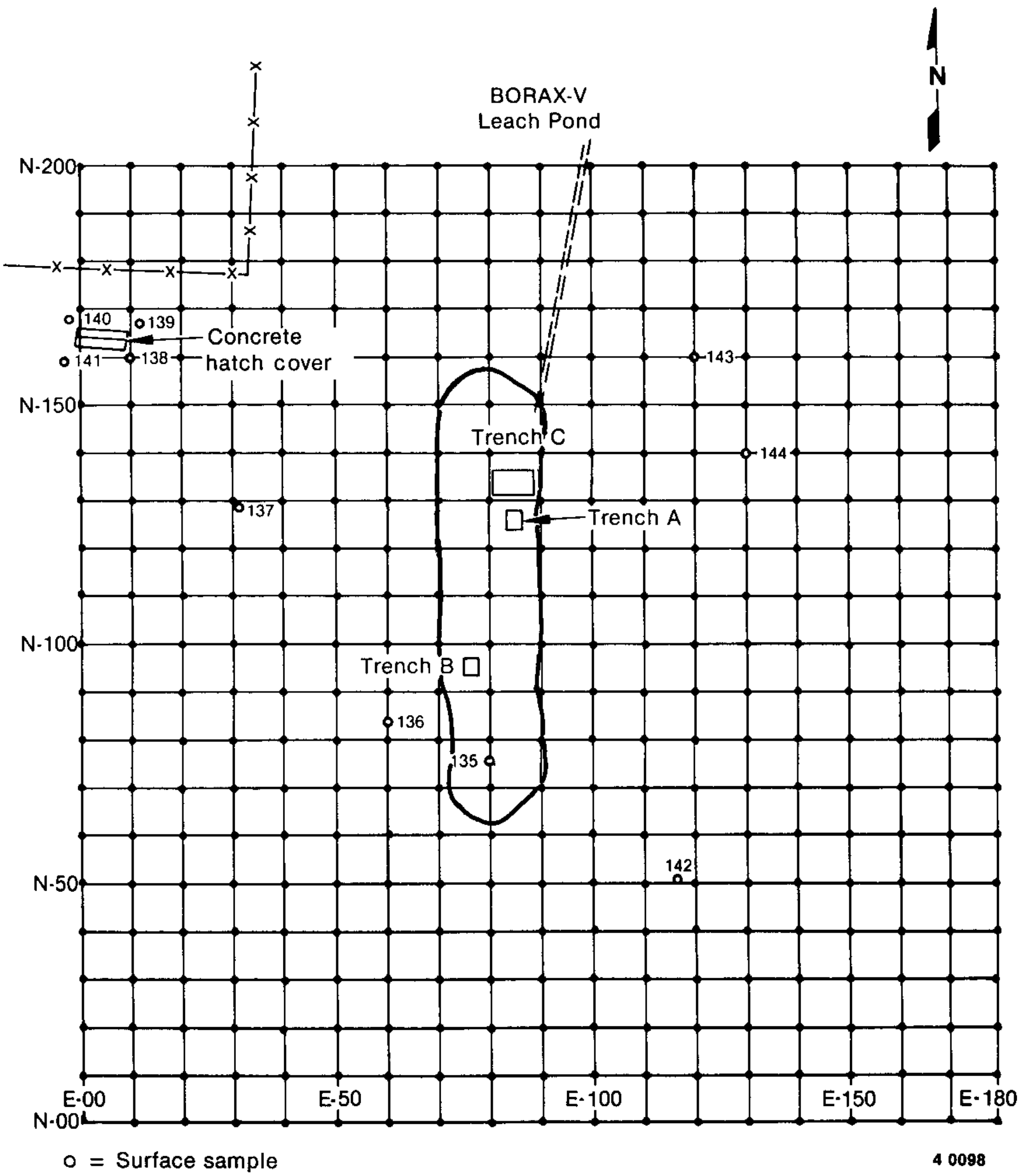


Figure 8. Location of surface samples and trench samples taken at BORAX-V leach pond.

Table 1. BORAX-V leach pond surface soil samples (gamma ray activity)

Sample Number	Weight (g)	Activity (pCi/g) Co-60 (1173 keV)	Cs-134 (795 keV)	Cs-137 (662 keV)	U-235 (186 keV)	K-40[a] (1460 keV)
135	455	—[b]	—	0.3 ± 0.1	—	15 ± 2
136	489	—	—	—	—	15 ± 2
137	542	—	—	—	—	20 ± 2
138	502	—	—	2.9 ± 0.2	—	18 ± 2
139	573	—	—	1.4 ± 0.1	—	16 ± 2
140	510	—	—	0.7 ± 0.1	—	18 ± 2
141	537	—	—	1.4 ± 0.1	—	15 ± 2
142	696	—	—	0.4 ± 0.1	—	10 ± 2
143	535	—	—	2.3 ± 0.2	—	20 ± 2
144	592	—	—	1.3 ± 0.1	—	16 ± 2
Ambient[c]	—	—	—	0.90	0.07	19.5

a. K-40 is a naturally occurring radioisotope and is shown for comparative purposes only.

b. Indicates below detection limits of 0.1 pCi/g for Cs-134, Cs-137, and Co-60, and 0.5 pCi/g for U-235, using gamma-ray spectrometry analysis. Errors (1 σ) are due to counting statistics only.

c. INEL mean ambient concentration in top 5 cm of soil for comparison purposes. The ambient concentration given for U-235 was not measured but is based on U-235/U-238 activity ratio of 0.046.

Table 2. BORAX-V leach pond trench soil samples (gamma-ray activity)

Trench	Sample Number	Depth Below Surface (in.)	Weight (g)	Activity (pCi/g) Co-60 (1173 keV)	Cs-134 (795 keV)	Cs-137 (662 keV)	U-235 (186 keV)	K-40[a] (1460 keV)
A	123a	Surface	418	—[b]	—	0.12 ± 0.03	—	19 ± 2
	123b	Surface	483	—	—	0.3 ± 0.1	—	18 ± 2
	123c	Surface	494	—	—	0.2 ± 0.1	—	17 ± 2
	123d	Surface	532	—	—	0.4 ± 0.1	—	18 ± 2
	124	6	423	—	—	—	—	19 ± 2
	125	12	412	—	—	—	—	18 ± 2
	126	18	444	1.0 ± 0.1	—	1.6 ± 0.2	—	14 ± 2
	127	24	429	4.8 ± 0.4	—	175.0 ± 1.9	0.6	15 ± 2
	128	30	392	—	—	32.3 ± 0.8	—	17 ± 2
B	129	Surface	466	—	—	—	—	13 ± 1
	130	6	459	—	—	—	—	15 ± 2
	131	12	413	—	—	—	—	16 ± 2
	132	18	439	—	—	0.18 ± 0.03	—	15 ± 2
	133	24	444	—	—	0.3 ± 0.1	—	12 ± 1
	134	30	444	8.3 ± 0.4	—	70 ± 1	—	14 ± 2
C (east side)	500	Surface	417	—	—	0.8 ± 0.1	—	20 ± 2
	501	12	360	—	—	0.5 ± 0.1	—	14 ± 2
	502	24	507	—	—	—	—	17 ± 2
	503	36	416	—	—	—	—	17 ± 2
	504	48	587	—	—	0.17 ± 0.03	—	15 ± 2
	505	54	507	—	—	0.5 ± 0.1	—	13 ± 2
	506	60	550	—	—	—	—	20 ± 2
	507	66	516	—	—	0.3 ± 0.1	—	17 ± 2
	508	72	508	—	—	0.25 ± 0.05	—	16 ± 2
	509	78	509	—	—	—	—	17 ± 2
	510	84	445	—	—	—	—	16 ± 2
	511	90	471	—	—	—	—	15 ± 2
	512	96	547	—	—	0.16 ± 0.03	—	15 ± 2
C (south side)	515	12	517	—	—	—	—	17 ± 2
	516	24	585	25 ± 1	—	36 ± 1	—	15 ± 2
	517	36	604	—	—	1.7 ± 0.2	—	18 ± 2
	518	48	476	—	—	0.9 ± 0.1	—	18 ± 2
	519	60	454	—	—	—	—	21 ± 2
	520	72	481	—	—	—	—	16 ± 2
	521	84	417	—	—	0.18 ± 0.04	—	15 ± 2
	522	96	457	0.3 ± 0.1	—	2.8 ± 0.2	—	16 ± 2

a. K-40 is a naturally occurring radioisotope and is shown for comparative purposes only.

b. Indicates below detection limits of 0.1 pCi/g for Cs-137, Cs-134, and Co-60; and 0.5 pCi/g for U-235, using gamma-ray spectrometry analysis.

Errors (1 σ) are due to counting statistics only.

Table 3. BORAX-V leach pond soil samples (alpha and beta activity)

	Activity (pCi/g)							
Sample Number	Gross Beta	Gross Alpha	Sr-90	Pu-238	Pu-239, 240	U-238	U-235	U-234
123b	11 ± 3	7 ± 2	0.1	0.1	0.05 ± 0.03	1.21 ± 0.05	0.054 ± 0.006	1.36 ± 0.05
510	8 ± 3	5 ± 2	0.3 ± 0.1	0.006	0.014 ± 0.003	1.10 ± 0.05	0.056 ± 0.008	1.44 ± 0.05
515	7 ± 2	5 ± 2	0.05	NA	NA[a]	NA	NA	NA
516	60 ± 5	2	0.19 ± 0.08	0.006	0.032 ± 0.004	1.4 ± 0.03	0.051 ± 0.006	1.31 ± 0.03
522	8 ± 3	3 ± 2	0.14 ± 0.08	NA	NA	NA	NA	NA

Uncertainties noted are one sigma confidence level and are due to counting statistics only.

a. Not analyzed for radionuclide.

Table 4. BORAX-V leach pond in situ trench readings

Trench	Depth from Surface (in.)	Radiation[a] Reading (counts/min)
A	6	100
	12	130
	18	120
	24	280
	30	180
B	6	80
	12	80
	18	110
	24	110
	30	230
C (east side)	12	100
	24	100
	36	80
	48	100
	54	120
	60	100
	66	110
	72	100
	78	100
	84	130
	90	150
	96	110
C (south side)	12	110
	24	290
	36	190
	48	170
	60	130
	72	110
	84	90
	96	80

a. Background readings averaged 93 ± 11 counts/min. The instrument counting efficiency was 30%.

3. DECOMMISSIONING OBJECTIVES AND WORK SCOPE

Objectives

The objectives of this project were to stabilize the pond area and prevent the spread of contamination. Stabilization of the pond also allows removal of the pond from the D&D surveillance and maintenance program.

Work Scope

The BORAX-V leach pond D&D consisted of backfilling the pond with radiologically clean soil, grading the area to match the surrounding terrain, planting grass on the backfilled and graded area, and erecting a permanent marker on the area to identify the subsurface contamination. The two discharge pipes were left in place until decommissioning of the BORAX-V Facility, at which time a decision will be made to either excavate the pipes or leave them in place.

4. WORK PERFORMED

The work performed consisted of the tasks shown in the work breakdown structure (WBS), Figure 9.

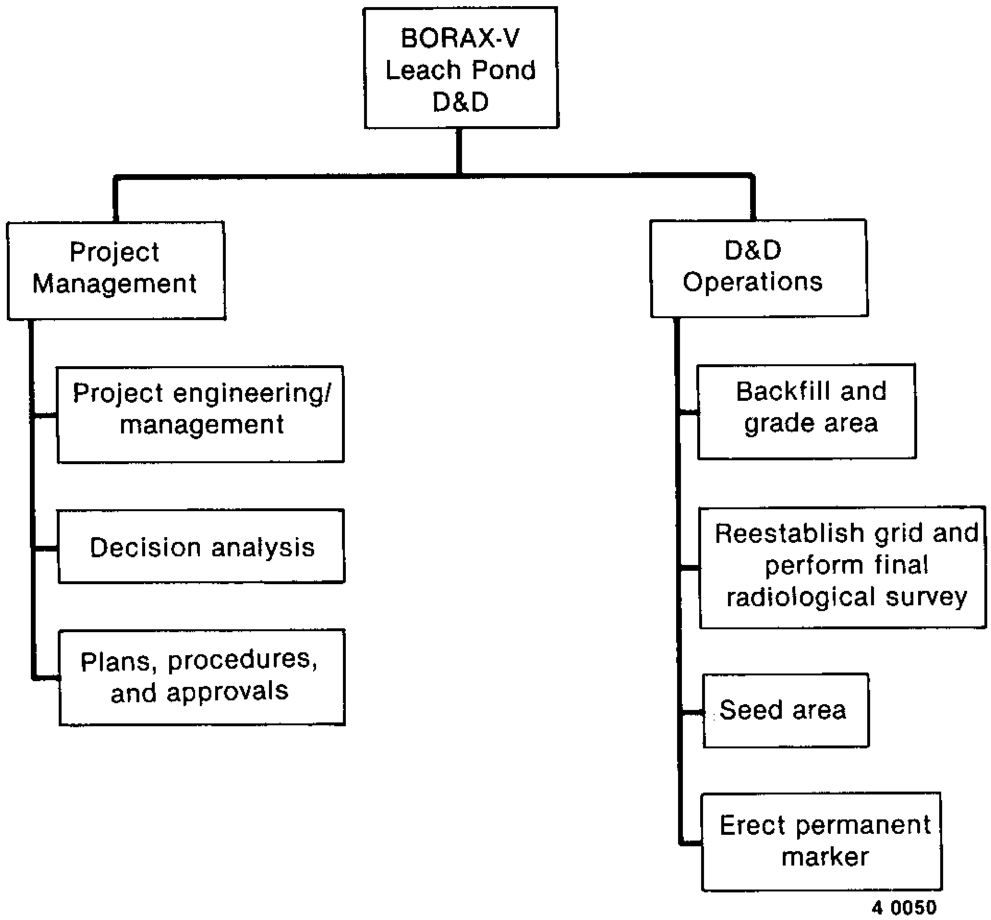


Figure 9. BORAX-V leach pond work breakdown structure.

Project Management

The Waste Management Programs Division (WMP) provided D&D project management. A project engineer was responsible for planning, coordination, and overall direction of the project, as well as all budgeting, scheduling, and reporting connected with the project. Safety reviews and approvals were obtained from the Health and Safety division.

Decision Analysis

A detailed decision analysis was performed during the consideration of alternatives for D&D of the BORAX-V leach pond. The five alternatives were:

1. Perform a complete D&D. Remove essentially all of the contaminated soil and excavate the two discharge pipes to the Turbine Building. The results of the characterization indicate that a cover of 1 to 2 ft of clean soil was deposited over the basin of the leach pond. For this alternative, to help ensure that all the contaminants would be successfully removed, no attempt would be made to segregate this top layer. Rather, the entire basin of the pond would be excavated to ∿3 ft, the soil boxed for disposal at the Radioactive Waste Management Complex (RWMC), and the pond backfilled with clean soil, graded, and seeded with native grass.

2. Perform a partial D&D by removing most of the contaminated soil. This would be done by scraping off ∿1 ft of the clean cover soil and laying it aside to later be used as backfill. Excavate and box a layer of soil from 1 to 2.5 ft. Remove the discharge pipes to the Turbine Building. Backfill,

grade, and seed with native grass. Erect a permanent marker to indicate the presence of subsurface contamination.

3. Leave the soil contaminants and backfill the pond with clean soil. Grade and seed with native grass. Erect a permanent marker at the pond site. Remove the discharge pipes to the Turbine Building.

4. Leave the soil contaminants and backfill the pond with clean soil. Grade and seed with native grass. Leave the discharge pipes in place. Erect a permanent marker at the pond site.

5. Do nothing.

The following factors were evaluated for all five alternatives: estimated cost, material reuse, surveillance and maintenance costs, volume of waste generated, radiation exposure to involved workers, short-term impact on INEL personnel and operations, and long-term impact to the public. Alternative four was chosen after the advantages and disadvantages of each alternative were compared and a cost-benefit analysis was performed.

Plans, Procedures and Approvals

The D&D plan and detailed operating procedures (DOP) for specific jobs were written; approvals for the plan from the Health and Safety and the Waste Management Programs divisions, and DOE/ID were obtained before starting D&D. The D&D plan included the safety evaluation, which was reviewed and approved by the Health and Safety Division. The DOPs were written by the Planning Branch and were reviewed and approved by WMP and the South INEL Safety Branch. Those internal documents are included in the project data package for the BORAX-V leach pond.

D&D Operations

Backfill and Grade Area. The pond basin was backfilled with approximately 10,800 ft^3 of topsoil as shown in Figure 10. In order not to cover the ends of the two discharge pipes, risers were installed on each pipe before completion of backfilling (Figure 11). Following backfilling, the area was graded to match the surrounding terrain as shown in Figure 12.

Reestablish Grid and Perform Final Radiological Survey. The original grid was reestablished over the backfilled and graded area as shown in Figure 13. The purpose of the grid was to allow a post-D&D radiological surface survey for comparison with the pre-D&D characterization.

A post-D&D radiological survey of the area surface was performed. Results of the survey are documented in Section 8 of this report. Only the area that was backfilled and graded was surveyed. The undisturbed area was previously characterized, and those results are documented in Section 2 of this report.

Seed Area. The Radiological and Environmental Sciences Laboratory (RESL) of DOE-ID had requested use of the backfilled pond for a field test of native grasses and plants which have been successfully grown experimentally at the INEL. The types of grasses and plants used are:

- Elymus lanceolatus (Riparian wheat grass)
- Pseudoroegneria spicatum (Bluebunch wheat grass)
- Oryzopsis hymenoides (Indian rice grass)
- Linum lewisii (Blueflax)
- Penstemon palmeri (Palmer Penstemon)

Erect Permanent Marker. Subsurface soil sampling and analysis revealed Cs-137 contamination as high as 175 pCi/g in the BORAX-V leach pond. The time required for this activity to decay to a soil screening level that produces a projected dose of 10 man-rem/year to a full-time occupant is about 200 years.

A permanent concrete marker with a stamped or engraved brass plate was placed at the center of the pond basin to indicate the presence of subsurface contamination and the presence of the buried discharge pipe. The top 2 ft of the marker are visible above the ground, and 2 ft are buried below the surface. A cross-sectional view of the marker is shown in Figure 14. Figure 15 shows the information engraved on the brass plate. Photographs of the marker after installation at the BORAX-V pond site are shown in Figures 16 and 17. Blotches on the brass plate in Figure 17 are caused by ice.

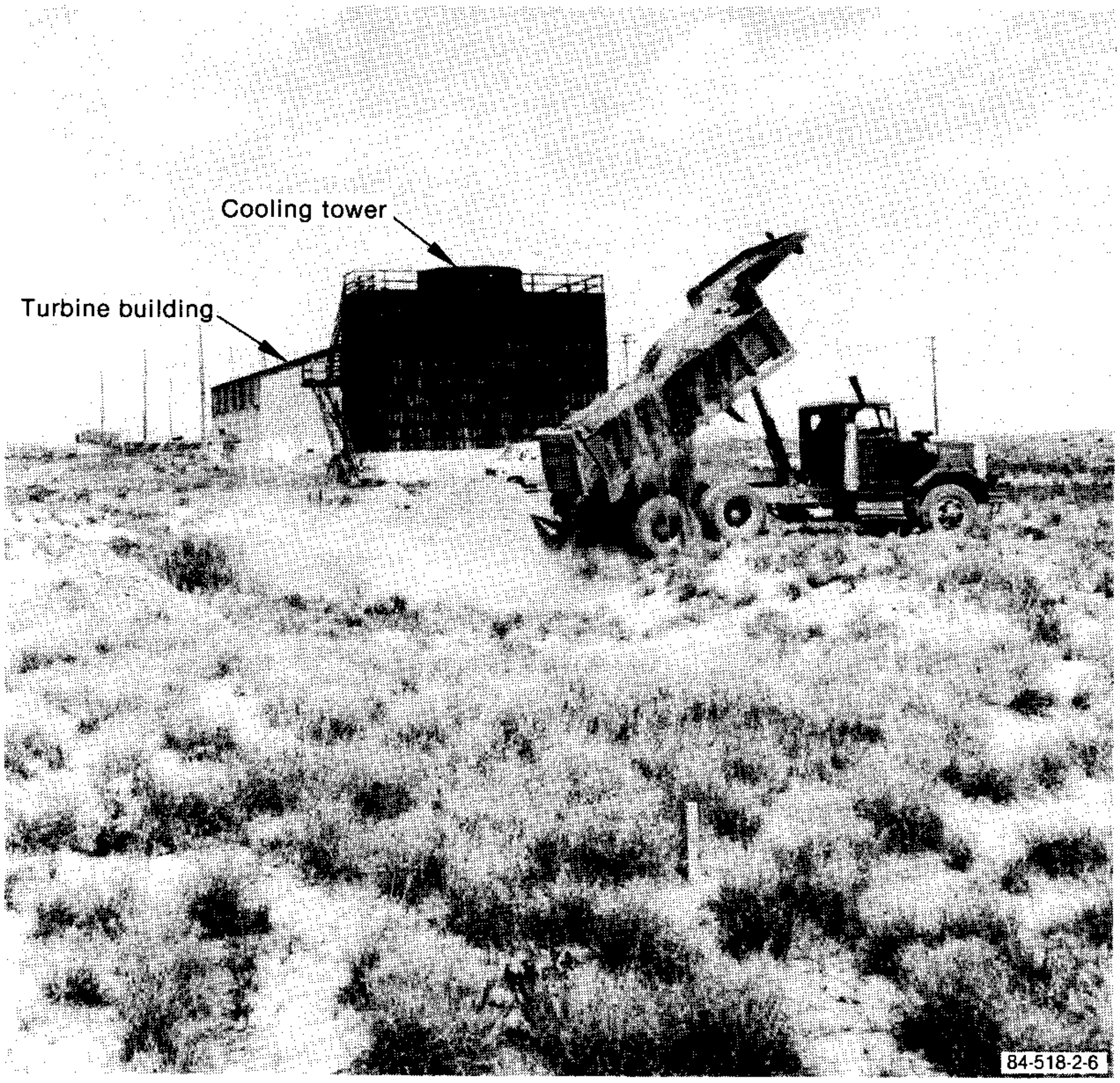


Figure 10. Start of backfilling at the BORAX-V leach pond.

Figure 11. Installation of risers on discharge pipes.

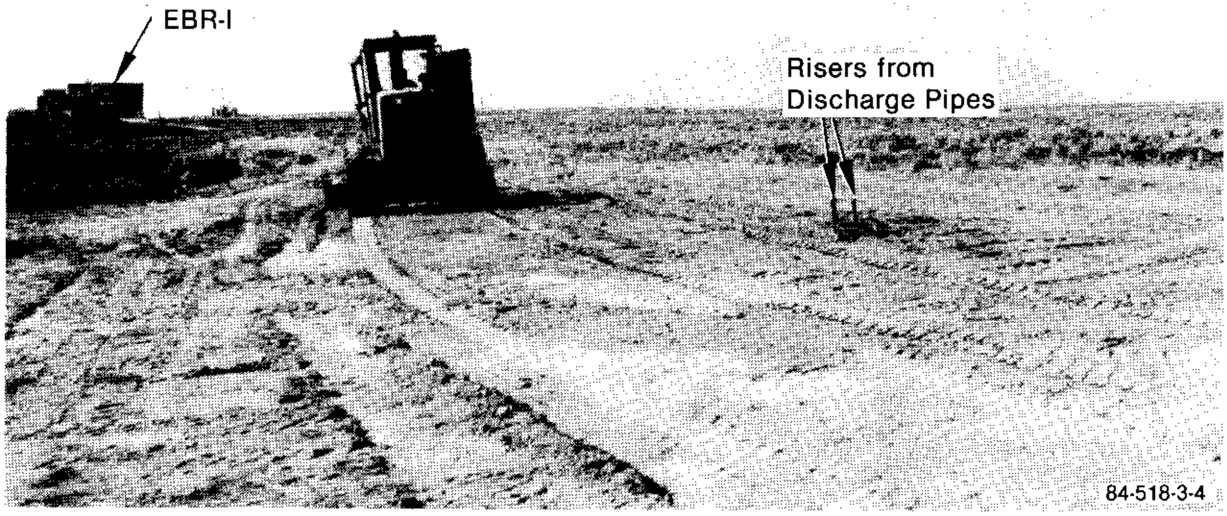


Figure 12. Grading the backfilled area to match surrounding terrain.

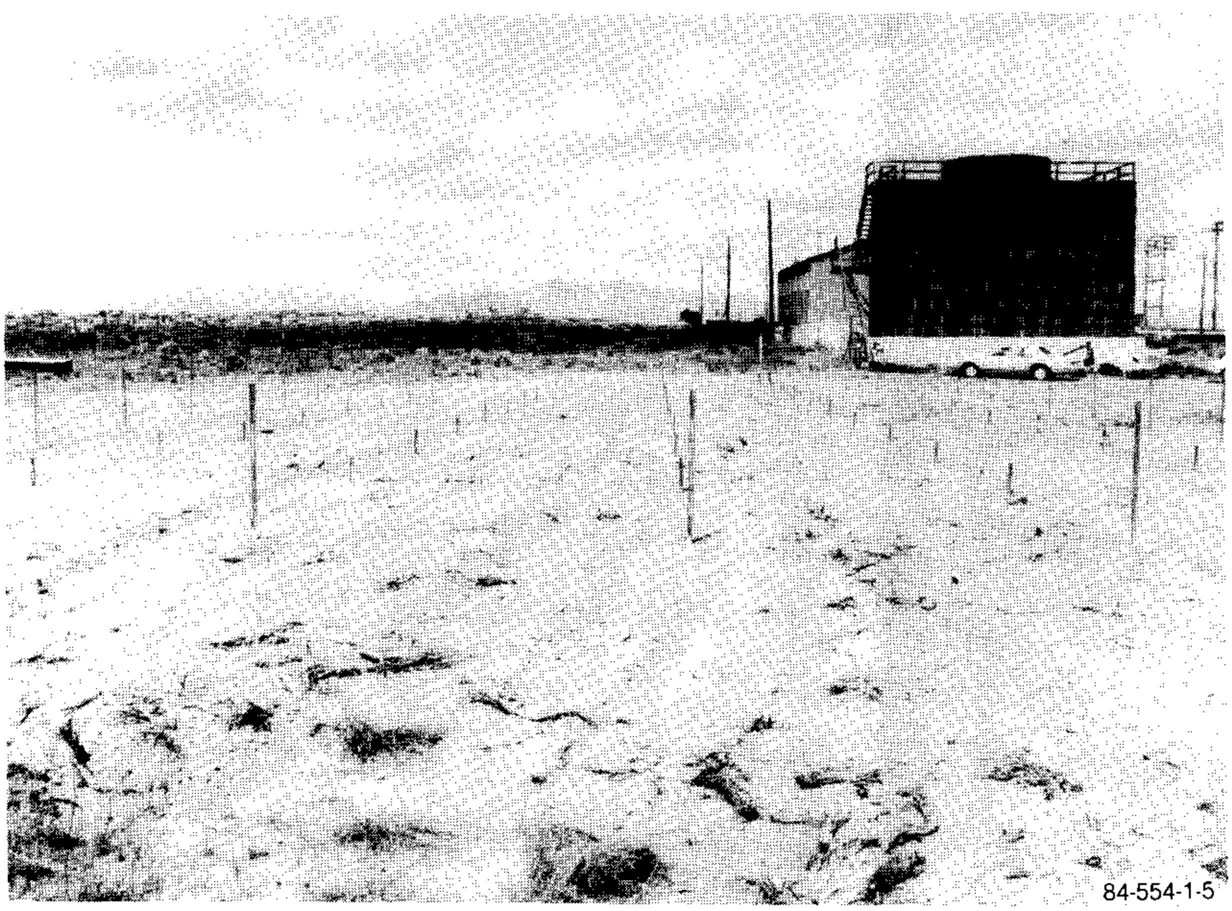


Figure 13. Grids at BORAX-V leach pond reestablished after backfilling and grading.

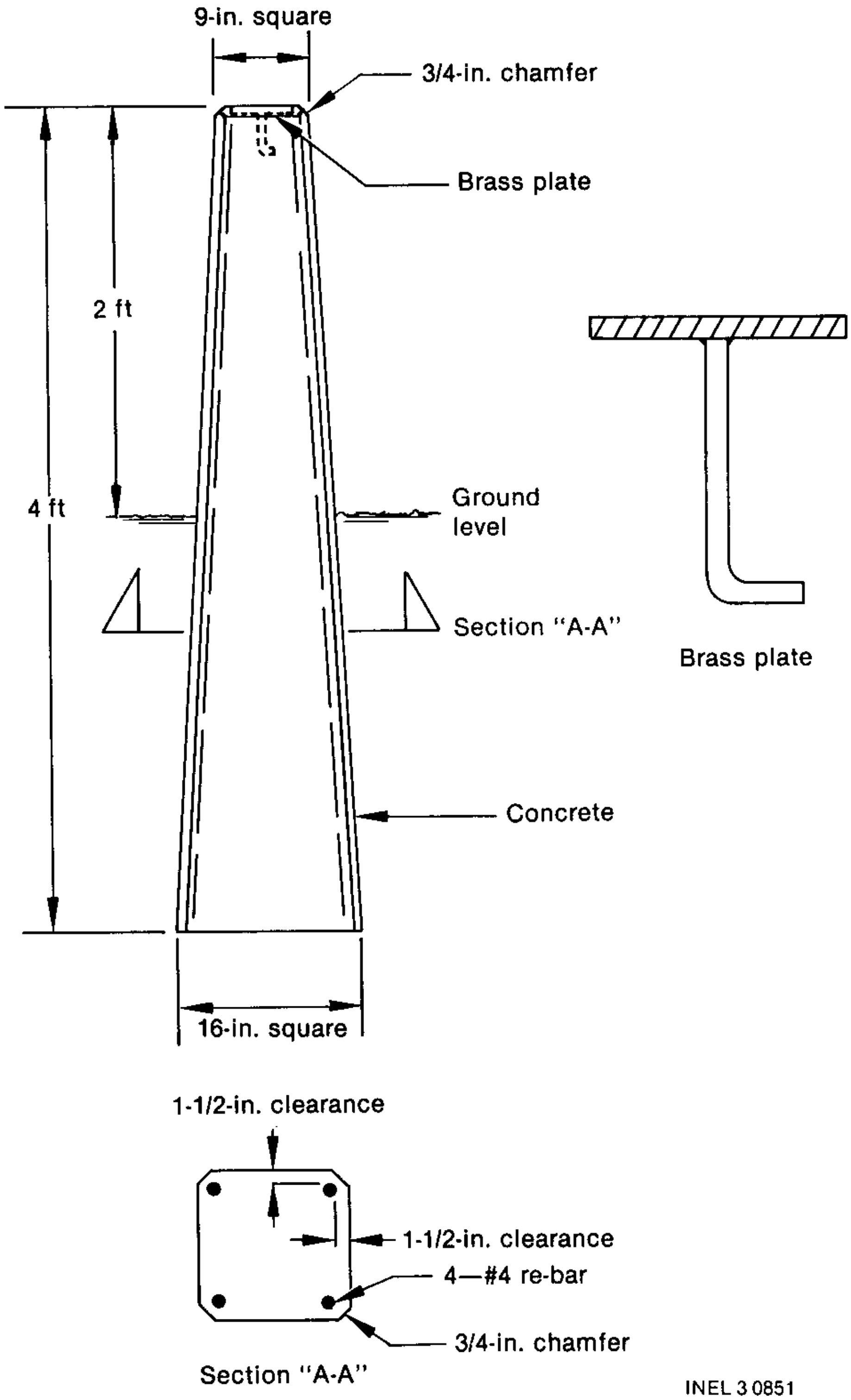


Figure 14. Permanent marker used at BORAX-V leach pond site.

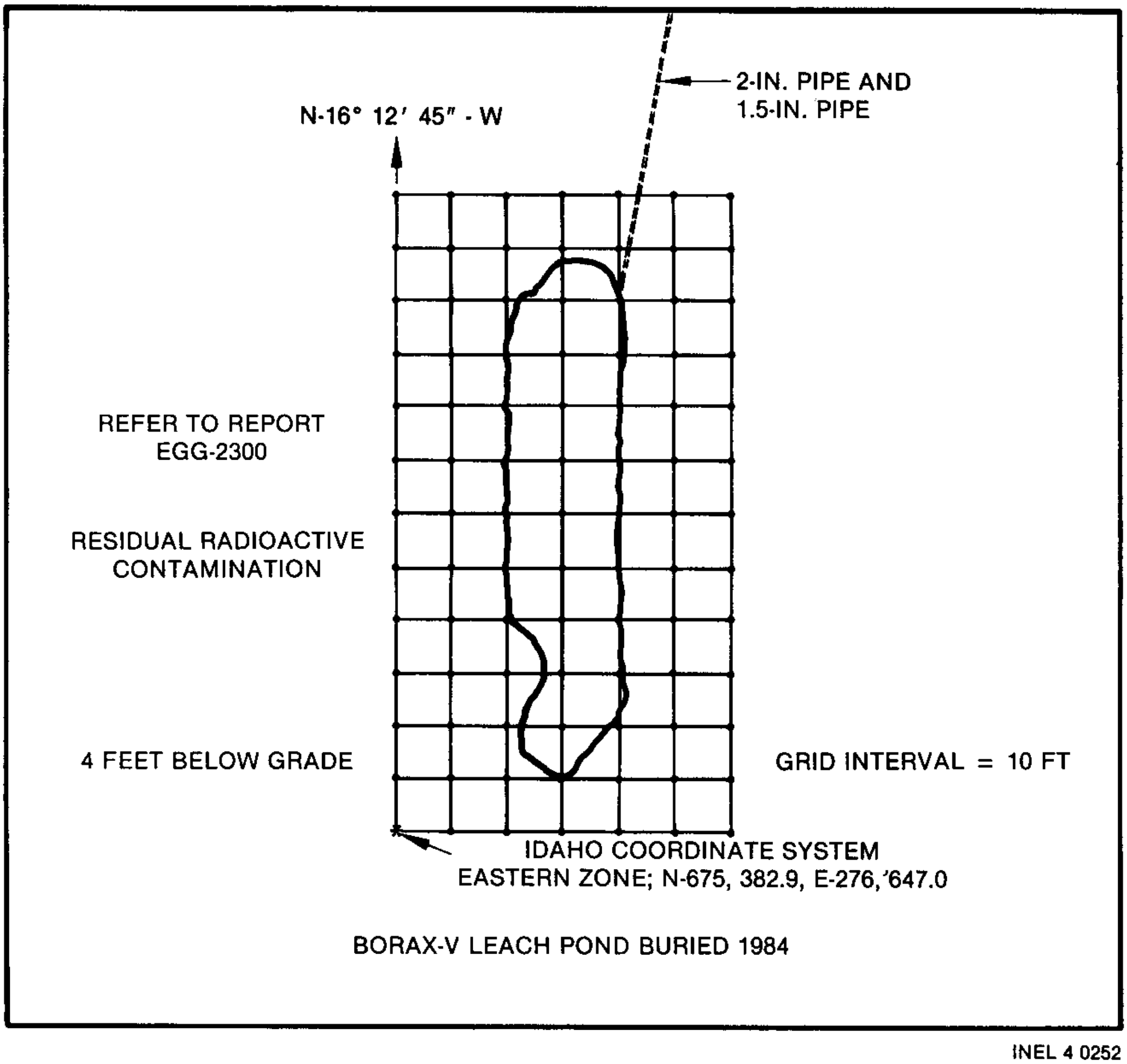


Figure 15. Diagram of brass plate used on concrete marker at the BORAX-V leach pond.

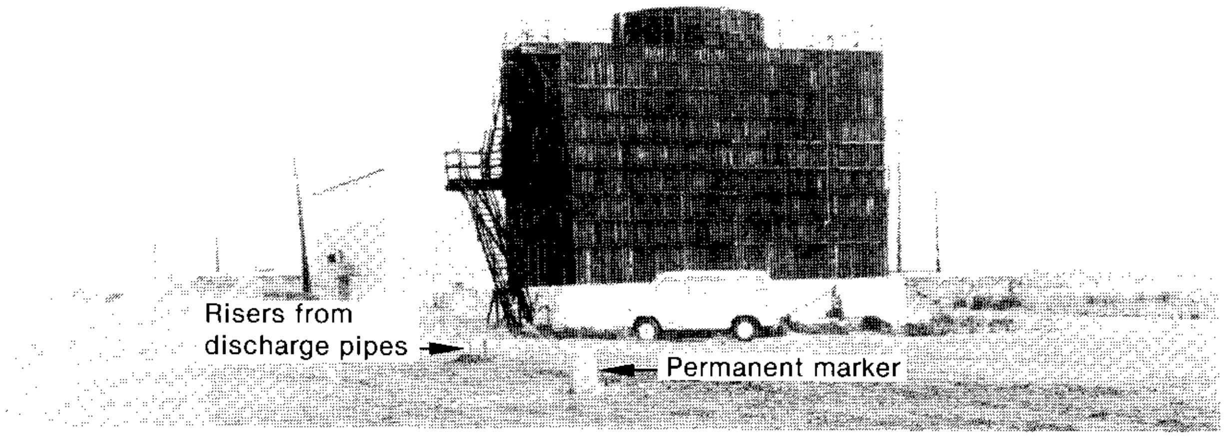


Figure 16. Permanent marker at BORAX-V leach pond.

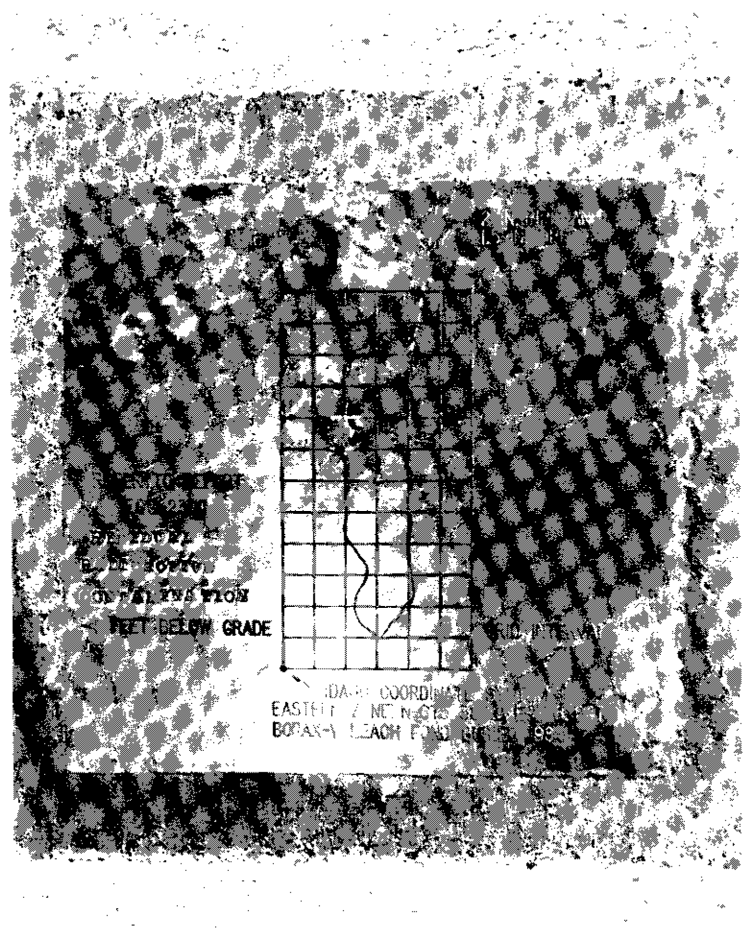


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Figure 17. Close-up view of permanent marker at BORAX-V leach pond.

The purpose of the marker is to alert all individuals to the presence of buried pipe and soil contaminants in the area.

5. COST AND SCHEDULE

Figure 18 is a critical path method (CPM) network showing the labor hours, material dollars, and durations of each task in this project. The total project cost including labor and material was $20K. The organization numbers appearing below each activity line in the CPM network are defined in Table 5.

Table 5. Definition of organization numbers in the CPM network, Figure 18

Organization Number	Organization Title
C31X	Technical Writing/Editing
C34X	Text Processing
1920	South INEL Safety
2630	Waste Technology Programs
3350	Engineering
4780	Planning and Scheduling
47XX	Plant Services/Crafts

6. WASTE VOLUMES GENERATED

No radiological waste was generated during this project.

7. OCCUPATIONAL EXPOSURE TO PERSONNEL

Workers wore radiation-detecting thermoluminescent dosimeters during all activities related to D&D of the BORAX-V leach pond. These film badges were collected and the dose determined and recorded. No radiation exposure occurred during this project.

8. POST-DECOMMISSIONING CONDITIONS

Following backfilling and grading of the pond area, the disturbed area was gridded, a surface radiological survey performed, and the area seeded with grasses and plants. Results of the surface survey are shown in Figure 19. The final physical condition of the BORAX-V leach pond is shown in Figure 20. The subsurface contamination is given in Section 2 of this report.

Post-D&D Status

The BORAX-V leach pond area will remain part of the INEL Surplus Facilities Management Program (SFMP) for two years after D&D. During this period, the effects of weather will be observed and corrective measures taken if necessary. In FY-1986 the BORAX-V leach pond will be evaluated and considered for removal from the SFMP list.

Project Data Package

A project data package was compiled during the entire course of the project. This project data package has been assigned EG&G document number DRR-WM-935, and the package will be stored indefinitely at the INEL Records Storage Center.

9. LESSONS LEARNED

The decommissioning of the BORAX-V leach pond was accomplished without incident. The project was completed within the budget and on schedule. This project utilized existing routine D&D practices, and no lessons were learned.

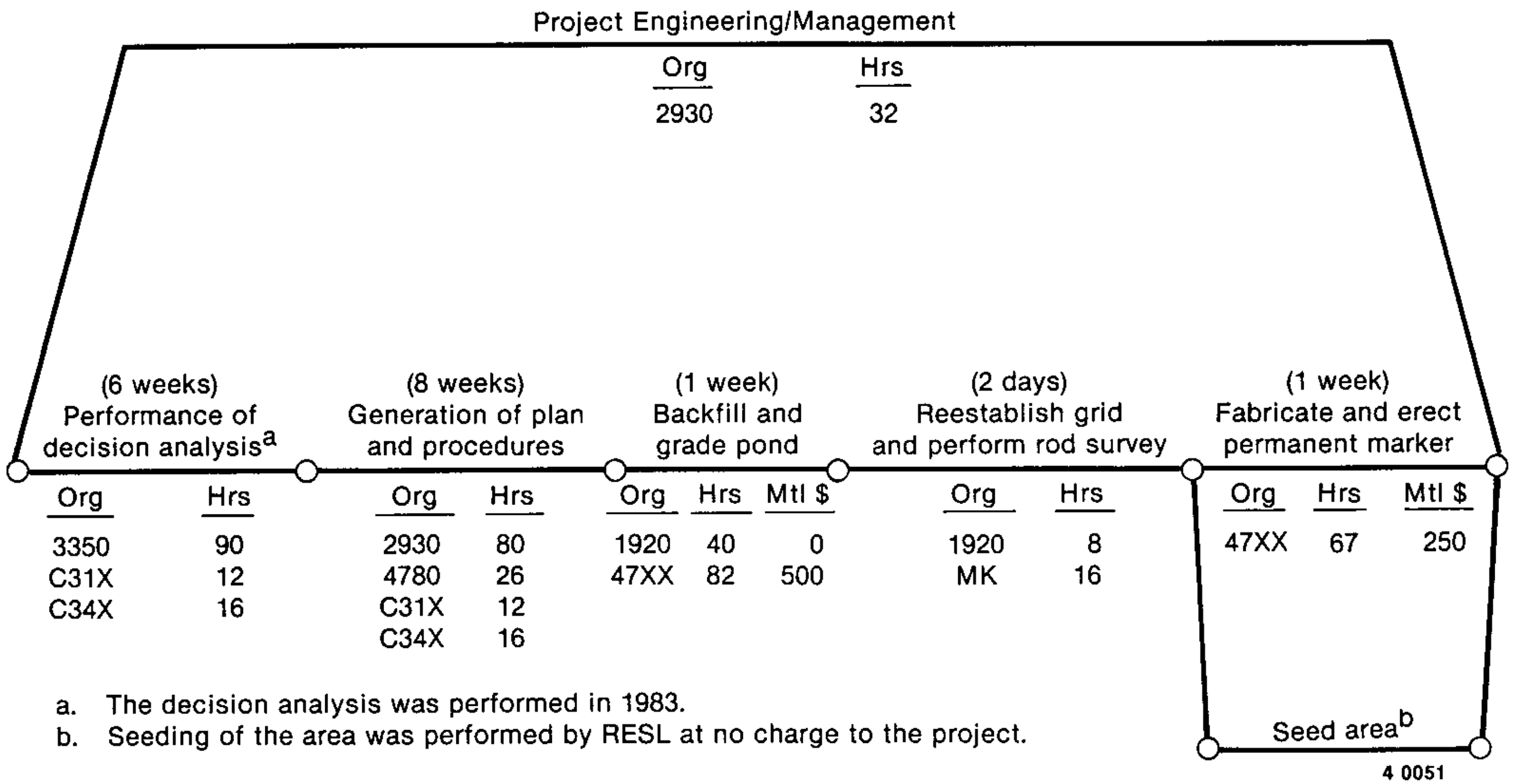

Figure 18. CPM network for the D&D of the BORAX-V leach pond.

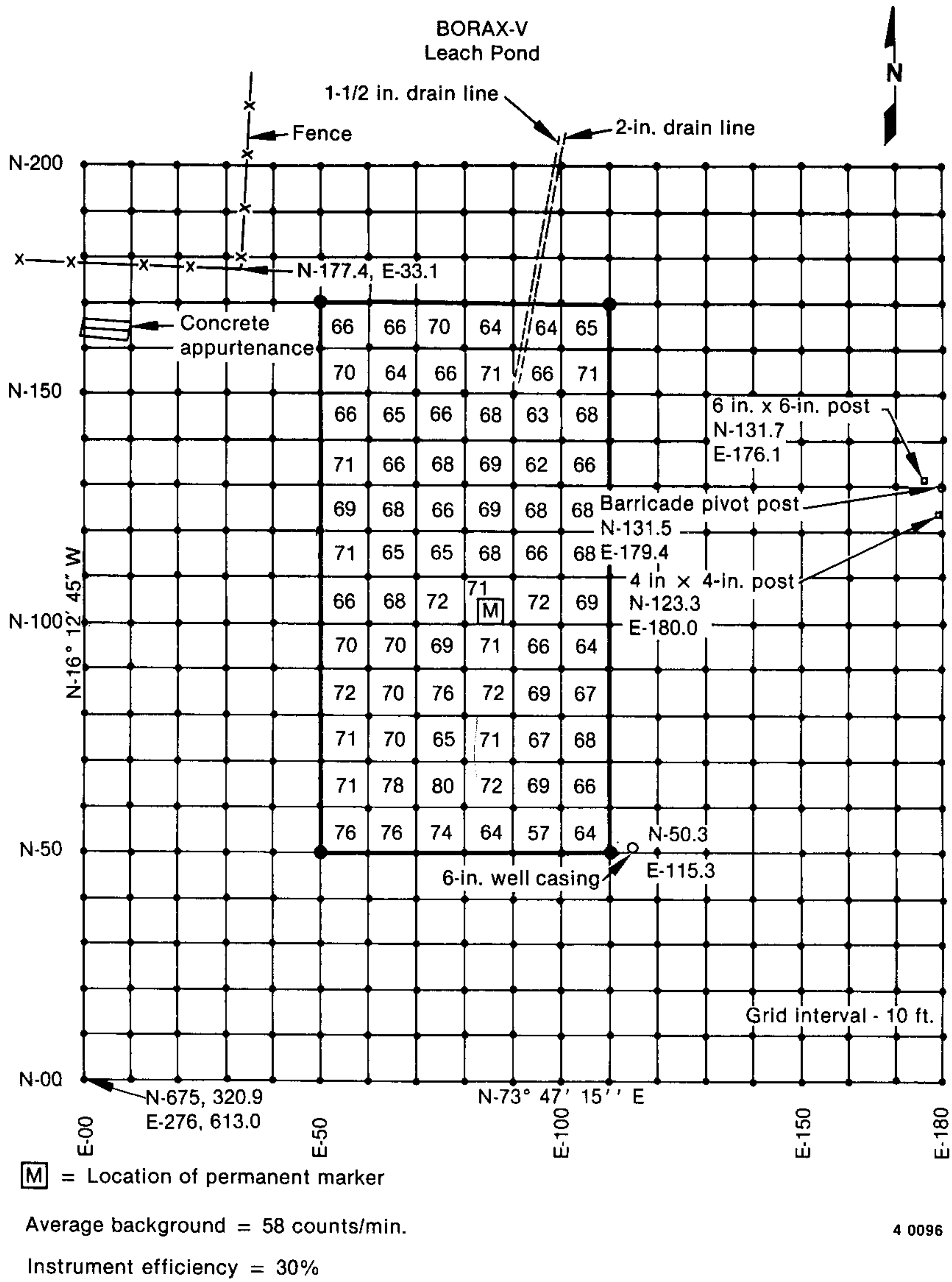

Figure 19. Surface radiation readings in counts/min after backfilling and grading.

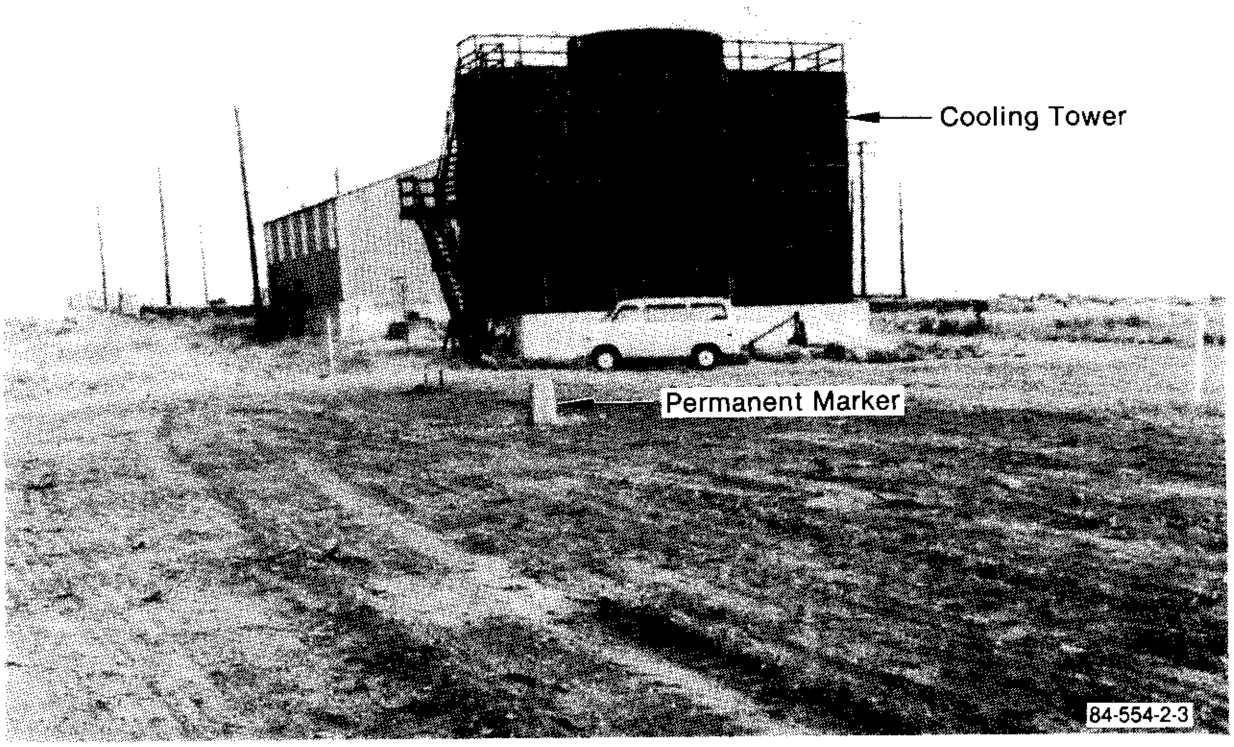

Figure 20. BORAX-V leach pond showing the final physical condition.

10. REFERENCES

1. L. A. Crews, *BORAX-V Leach Pond Characterization*, EG&G Idaho Internal Technical Report WM-F1-82-019, December 1982.

2. L. A. Crews and J. D. Bradford, *Decision Analysis for BORAX-V Leach Pond*, EG&G Idaho Internal Technical Report WM-F1-83-013, August 1983.

3. D. L. Smith, *Decontamination and Decommissioning Plan for the BORAX-V Leach Pond*, EG&G Idaho Internal Technical Report PG-WM-84-004, May 1984.

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